Intel® MPI Library 2017 Update 3 for Windows* OS Release Notes

Contents

Overview

The Intel® MPI Library for Windows* OS is a multi-fabric message passing library based on ANL* MPICH3* and OSU* MVAPICH2* that implements the Message Passing Interface, version 3.1 (MPI-3.1) specification. The library is thread-safe and provides the MPI standard compliant multi-threading support.

To receive technical support and updates, you need to register your Intel® Software Development Product. See section Technical Support.

Product Contents

The Intel® MPI Library Runtime Environment (RTO) contains the tools you need to run programs including Hydra services and supporting utilities, dynamic libraries, and documentation.

The Intel® MPI Library Development Kit (SDK) includes all of the Runtime Environment components plus include files and modules, interface libraries, debug libraries and test codes.

Related Products and Services

Information on Intel® Software Development Products is available at http://www.intel.com/software/products.

What's New

See https://software.intel.com/en-us/articles/intel-cluster-tools-deprecation-information for a current list of deprecated features

Intel® MPI Library 2017 Update 3

- Minor fixes.

Intel® MPI Library 2017 Update 2

- Added the `I_MPI_HARD_FINALIZE` environment variable.

Intel® MPI Library 2017 Update 1

- Support for topology-aware collective communication algorithms (`I_MPI_ADJUST` family).
- Deprecated support for cross-OS launches.

Intel® MPI Library 2017

- Support for the MPI-3.1 standard.
- Removed the SMPD process manager.
- Removed the SSHM support.
- Deprecated support for the Intel® microarchitectures older than the generation codenamed Sandy Bridge.
- Bug fixes and performance improvements.
- Documentation improvements.
- The MPI Tuner Tutorial is removed from the installation and is available online at https://software.intel.com/en-us/intel-software-technical-documentation

Intel® MPI Library 5.1 Update 3

- Deprecation list updated. New deprecations:
  - SSHM
  - SMPD
  - JMI
- New algorithms and selection mechanism for nonblocking collectives.
- Added I_MPI_BCAST_ADJUST_SEGMENT variable to control MPI_Bcast.
- Fixed long count support for some collective messages.
- Binding kit reworked with support for Intel(R) Many Integrated Core Architecture and support for ILP64 on third party compilers.

Intel® MPI Library 5.1 Update 2

- ILP64 support enhancements, support for MPI modules in Fortran 90.

Intel® MPI Library 5.1 Update 1

- Change the named-user licensing scheme. See more details in the Installation Instructions section of *Intel® MPI Library Installation Guide*.
- Bug fixes

Intel® MPI Library 5.1

- Added the Troubleshooting chapter to the *Intel® MPI Library Developer Guide*.
- Added the `MPI_Pcontrol` feature for internal statistics.
- Increased the possible space for `MPI_TAG`.
- Changed the default installation directory to `C:\Program Files (x86)\IntelSWTools`. See the *README* document for details.
- Bug fixes

NOTE: Intel® MPI Benchmarks is delivered as part of Intel® MPI Library. For the new features of Intel® MPI Benchmarks, see the What's New section in *Intel® MPI Benchmarks README*.

Intel® MPI Library 5.0 Update 3

- Support for the rename mechanism for the file, stats.txt, to avoid overwriting
- Native statistics collection can be controlled with MPI_Pcontrol
- Bug fixes

Intel® MPI Library 5.0 Update 2

- Enhancements to statistics gathering mode

- Bug fixes

Intel® MPI Library 5.0 Update 1

- Directory structure update. New shortcuts have been added to always point to the most recently installed version of the Intel® MPI Library
- Bug fixes, including:
  - Resolving problem where Hydra with `-localroot` causes `pmi_proxy` to only spawn on local host.
- Collective performance improvements
- Documentation update
- Man pages copyright updated
- Added support for `-fopenmp` in `mpiicc`, `mpiicpc`, and `mpiifort`
- Improved pinning under job schedulers

Intel® MPI Library 5.0

- Support for Hydra* process manager on Windows* OS by default
- Added option `I_MPI_JOB_RESPECT_PROCESS_PLACEMENT` to honor process placement from job schedulers
- All IA-32 architecture support has been removed
- Added debug information without private symbols to optimized libraries. Added `.pdb` files to get call stack when an application crashes.
- Implement the MPI-3 standard including but not limited to:
  - Non-blocking collective operations
  - Fast one-sided operations
  - Large counts for messages greater than 2GB
- Allow permuted entries in machine file when running a single instance of pmi-proxy
- Support for mixed operating systems in the Hydra* process manager
- Make the following changes to documentation:
  - Changed the Intel® MPI Library Getting Started Guide to Intel® MPI Library Developer Guide
  - Add the Intel® MPI Library Getting Started page
  - Add the tutorial: MPI Tuner for Intel® MPI Library
- Bug fixes
- Deprecate MPD and SMPD process managers

Intel® MPI Library 4.1 Update 3

- Additional performance tuning for the Intel® Xeon® Processors E5 V2 and E7 V2
- New online documentation format
- Bug fixes

Intel® MPI Library 4.1 Update 2

- Performance tuning for the Intel® Xeon® Processors E5 V2 and E7 V2
- Allow permuted entries in machine file when running a single instance of pmi-proxy
- Bug fixes

Intel® MPI Library 4.1 Update 1

- Intel® Xeon Phi™ offload model support

- Hydra* (Scalable process manager) support on Windows* OS (experimental)
- Microsoft* Network Direct support
- Bug fixes

Intel® MPI Library 4.1

- Support for the MPI-2.2 standard
- Backward compatibility with Intel MPI Library 4.0.x based applications
- New documentation in the HTML format
- Support for Intel® Composer XE 2013
- Support for clusters with different Intel® Architecture Processors
- Bug Fixes

Key features

This release of the Intel® MPI Library supports the following major features:

- MPI-1, MPI-2.2 and MPI-3.1 specification conformance with some limitations. See Special Features and Known Issues
- - Support for any combination of the following interconnection fabrics:
    - Shared memory
    - RDMA-capable network fabrics through DAPL*, such as InfiniBand* and Myrinet*
    - Sockets, for example, TCP/IP over Ethernet*, Gigabit Ethernet*, and other interconnects
- (SDK only) Support for Intel® 64 architecture clusters using:
    - Intel® C++ Compiler version 15.0 through 17.0 and higher
    - Intel® Fortran Compiler version 15.0 through 17.0 and higher
    - Microsoft* Visual C++* Compilers
- (SDK only) C, C++, Fortran* 77 and Fortran 90 language bindings
- (SDK only) Dynamic linking

System Requirements

The following sections describe supported hardware and software

Supported Hardware

Systems based on the Intel® 64 architecture, in particular:

- Intel® Core™ 2 processor family or higher
- Intel® Xeon® E5 v3 processor families recommended
- Intel® Xeon® E7 v2 processor families recommended
- 1 GB of RAM per core
- 2 GB of RAM per core recommended
- 1 GB of free hard disk space

Supported Software

Operating Systems:

- Systems based on the Intel® 64 architecture:
    - Microsoft* Windows* Server 2008
    - Microsoft* Windows* Server 2008 R2
    - Microsoft* Windows* Server 2012
    - Microsoft* Windows* Server 2012 R2
    - Microsoft* Windows* Server 2016
    - Microsoft* Windows 7*

    - Microsoft* Windows 8*
    - Microsoft* Windows 8.1*
    - Microsoft* Windows 10*

(SDK only) Compilers:

- Intel® C++ Compiler 15.0 through 17.0 for Windows* OS
- Intel® Fortran Compiler 15.0 through 17.0 for Windows* OS
- Microsoft* Visual Studio 2012*
- Microsoft* Visual Studio 2013*
- Microsoft* Visual Studio 2015*
- Microsoft* Visual C++* Compilers

Batch Systems:

- Microsoft* job scheduler
- Altair* PBS Pro* 9.2 and higher

Recommended InfiniBand Software:

- Windows* OpenFabrics* (WinOF*) 2.0 or higher
- Windows* OpenFabrics* Enterprise Distribution (winOFED*) 3.2 RC1 or higher for Microsoft* Network Direct support
- Mellanox* WinOF* Rev 4.40 or higher

Supported Languages

- For Intel® Compilers: C, C++, Fortran 77, Fortran 90

Installation Notes

Launch the installer and follow the instructions. See *Intel® MPI Library for Windows* OS Installation Guide* for details.

Using Intel® Software License Manager

If you have purchased a "floating" license, see Intel® Software License Manager Getting Started Tutorial for information on how to install using a license file or license manager. This article also provides a source for the Intel® Software License Manager that can be installed on any of a wide variety of systems.

Known Issues and Limitations

- Cross-OS runs using ssh from a Windows* host fail. Two known workarounds exist:
    - Create a symlink on the Linux* host that looks identical to the Windows* path to pmi_proxy.
    - Start hydra_persist on the Linux* host in the background (`hydra_persist &`) and use `-bootstrap service` from the Windows* host. This requires that the Hydra service also be installed and started on the Windows* host.
- Support for Fortran 2008 is not yet implemented in Intel® MPI Library for Windows*.
- Switching on statistics gathering could result in increased time in MPI_Finalize.
- In order to run a mixed operating system job (Linux* and Windows*), all binaries must link to the same single or multithreaded MPI library. The single and multithreaded libraries are incompatible with each other and should not be mixed. Note that the pre-compiled binaries for the Intel® MPI Benchmarks are inconsistent (Linux* version links to multithreaded, Windows* version links to single threaded) and as such, at least one must be rebuilt to match the other.
- Intel® MPI Library 5.x for Windows* OS is binary compatible with the majority of Intel MPI Library 4.1.x-based applications. Recompile your application only if you use:

    - `MPI_Dist_graph_create`, `MPI_Dist_graph_create_adjacent`, `MPI_Dist_graph_neighbors`, `MPI_Dist_graph_neighbors_count`, (C, C++, Fortran)
    - `MPI::Get_address` (C++ only)

- If communication between two existing MPI applications is established using the process attachment mechanism, the library does not control whether the same fabric has been selected for each application. This situation may cause unexpected applications behavior. Set the same `I_MPI_FABRICS` variable for each application to avoid this issue.
- (SDK only) Provide the `msvcr71.dll` library to the end user if your product redistributes the `mpitune` utility.
- (SDK only) The `nmake` utility does not work correctly if the path to the Intel® MPI Library compiler drivers contains spaces. For instance, `C:\Program Files (x86)\IntelSWTools\MPI\<version>\bin\`. Copy the Intel® MPI Library compiler drivers to another location to avoid this issue.
- Hydra process manager on Windows* OS has some known limitations such as:
    - `Stdin` redirection is not supported for the `-bootstrap` service option.
    - Signal handling support is restricted. It could result in hanging processes in memory in case of incorrect MPI job termination.
    - Cleaning up the environment after an abnormal MPI job termination by means of `mpicleanup` utility is not supported
- ILP64 is not supported by MPI modules for Fortran* 2008.
- When using the `-mapall` option, if some of the network drives require a password and it differs from the user password, the application launch will fail.

NOTE: Many routines in the `libirc.lib` library (linked with the Intel® MPI Library) are more optimized for Intel microprocessors than for non-Intel microprocessors.

Documentation

Intel® MPI Library for Windows* OS Getting Started page contains information on the following subject:

- Compiling and running your MPI program

Intel® MPI Library for Windows* OS Developer Guide contains information on the following subjects:

- First steps using the Intel® MPI Library
- First-aid troubleshooting actions

Intel® MPI Library for Windows* OS Developer Reference contains information on the following subjects:

- Command Reference describes commands, options, and environment variables
- Tuning Reference describes environment variables that influence library behavior and performance

Intel® MPI Library for Windows* OS Installation Guide contains information on the following subjects:

- Obtaining, installing, and uninstalling the Intel® MPI Library
- Getting technical support

Tutorial: MPI Tuner for Intel® MPI Library contains information on the following subjects:

- How to use the MPI Tuner for Intel® MPI Library to get optimized configuration files for the runtime library automatically
- How to troubleshoot common issues with the MPI tuner

Notation Conventions

Release Notes and user guide documentation use the notation conventions listed in the following table:

Style	Definition
`This type style`	indicates an element of syntax, a reserved word, a keyword, a file name, or part of a program example (text appears in lowercase unless UPPERCASE is required)
`This type style`	indicates what you type as input
`This type style`	indicates an argument on a command line or an option's argument
[*`items`*]	indicates that the items enclosed in brackets are optional
{ *`item`* | *`item`* }	indicates a set of choices from which you must select one
`...` (ellipses)	indicates that an argument can be repeated several times

Technical Support

Your feedback is very important to us. To receive technical support for the tools provided in this product and technical information including FAQ's and product updates, please register your product at the Intel® Registration Center. If your license includes access to Intel® Premier Support, registration will grant that access.

To receive support for this product, you can submit an issue by logging in to Intel® Premier Support or posting a thread on the Intel® Developer Zone forums. If you have forgotten your password, please email a request to: quad.support@intel.com. Please do not email your technical issue to this email address.

The Intel(R) MPI Library support web site, http://software.intel.com/en-us/articles/intel-mpi-library-for-windows-kb/all/ provides the latest top technical issues, frequently asked questions, product documentation, and product errata.

There is an HPC and Intel® Cluster Tools Forum for HPC experts and enthusiasts to share their knowledge, resources, and insights for the advancement of HPC solutions, cluster solutions, and the computing architectures that implement them.

Submitting Issues

Before submitting a support issue, see the *Intel® MPI Library for Windows* OS Developer Guide* for details on post-install testing to ensure that basic facilities are working.

When submitting a support issue to Intel® Premier Support, please provide specific details of your problem, including:

- The Intel® MPI Library package name and version information
- Host architecture
- Compiler(s) and versions
- Operating system(s) and versions
- Specifics on how to reproduce problems. Include makefiles, command lines, small test cases, and build instructions.Use `/test` sources as test cases, when possible.

You can obtain version information for the Intel® MPI Library package in the file `mpisupport.txt`.

Steps to submit an issue

1. Go to https://premier.intel.com/
2. Log in to the site. Note that your username and password are case-sensitive.
3. Click on the "Submit Issue" link in the left navigation bar.
4. Choose "Development Environment" from the "Product Type" drop-down list.
5. If this is a software or license-related issue, choose "Intel® MPI Library, Windows" from the "Product Name" drop-down list.
6. Enter your question and complete the fields in the windows that follow to successfully submit the issue.

NOTE: Please notify your support representative prior to submitting source code where access needs to be restricted to certain countries to determine if this request can be accommodated.

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